

CLAIMS:

What we claim as our invention is:

1. A polymer blend comprising:
an ethylene-propylene random copolymer; and
a modifier selected from the group consisting of a metallocene-catalyzed polyethylene-based copolymer, a metallocene-catalyzed polyethylene-based terpolymer, and a syndiotactic polypropylene homopolymer.
2. The polymer blend of claim 1, further comprising an organic peroxide such as 2,5-dimethyl-2,5 di-(tert-butylperoxy) hexane and 3,6,9-triethyl-3,6,9-trimethyl-1,2,4,5,7,8-hexonone.
3. The polymer blend of claim 1, wherein the ethylene-propylene copolymer comprises about 2 weight percent ethylene.
4. The polymer blend of claim 1 wherein the modifier comprises about 7 weight percent of the blend.
5. The polymer blend of claim 4 wherein the modifier is a metallocene-catalyzed polyethylene-based copolymer.
6. The polymer blend of claim 4 wherein the modifier is a metallocene-catalyzed polyethylene-based terpolymer.

7. The polymer blend of claim 4 wherein the modifier is a syndiotactic polypropylene homopolymer.

8. A film made from a polymer blend comprising:
an ethylene-propylene random copolymer; and
a modifier selected from the group consisting of a metallocene-catalyzed polyethylene-based copolymer, a metallocene-catalyzed polyethylene-based terpolymer, and a syndiotactic polypropylene homopolymer.

9. The film of claim 8, further comprising an organic polymer such as 2,5-dimethyl-2,5-di-(tert-butylperoxy) hexane and 3,6,9-triethyl-3,6,9-trimethyl-1,2,4,5,7,8-hexonone.

10. The film of claim 8 having an Elmendorf tear strength (ASTM D1922) value of at least about 300 g/ply in the transverse direction and at least about 300 g/ply in the machine direction.

11. The film of claim 8 wherein the modifier is a metallocene-catalyzed polyethylene-based copolymer, and the film has a tensile strength (ASTM D638) value of at least about 7.4 lb/in in the machine direction and at least about 7.2 lb/in in the transverse direction.

12. The film of claim 11 having an Elmendorf tear strength (ASTM D1922) value of at least about 520 g/ply in the transverse direction and at least about 520 g/ply in the machine direction.

13. The film of claim 11 having a drop dart (ASTM D1709) value of at least about 300 g.

14. The film of claim 8 wherein the modifier is a metallocene-catalyzed polyethylene-based terpolymer and the film has a tensile strength (ASTM D638) value of at least about 7.4 lb/in in the machine direction and at least about 7.2 lb/in in the transverse direction.

15. The film of claim 14 having an Elmendorf tear strength (ASTM D1922) value of at least about 880 g/ply in the transverse direction.

16. The film of claim 14 having an Elmendorf tear strength (ASTM D1922) value of at least about 490 g/ply in the machine direction.

17. The film of claim 14 having a drop dart (ASTM D1709) value of at least about 300 g.

18. The film of claim 14 having a tensile strength of at least about 7.4 lb/in in the machine and transverse directions, an Elmendorf tear strength of at least about 340 g/ply, a dart drop value of at least about 340 g, and a haze (ASTM D1003) value less than or equal to about 7.0%.

19. The film of claim 8 wherein the modifier is a syndiotactic polypropylene homopolymer and the film has a haze (ASTM D1003) value less than or equal to about 0.7%.
20. The film of claim 19 having a tensile strength (ASTM D638) value of at least about 7.5 lb/in in the machine direction and at least about 7.1 lb/in in the transverse direction.
21. The film of claim 19 having an Elmendorf tear strength (ASTM D1922) value of at least about 410 g/ply in the machine direction.
22. The film of claim 19 having an Elmendorf tear strength (ASTM D1922) value of at least about 450 g/ply in the transverse direction.
23. A method of making a polymer blend comprising:
providing an ethylene-propylene random copolymer; and
blending a modifier selected from the group consisting of a metallocene-catalyzed polyethylene-based copolymer, a metallocene-catalyzed polyethylene-based terpolymer, and a syndiotactic polypropylene homopolymer with the ethylene-propylene random copolymer to form the polymer blend.
24. The method of claim 23, further comprising visbreaking the polymer blend.
25. The method of claim 24, further comprising forming the polymer blend into a film.

26. An end-use article made from a polymer blend comprising:
an ethylene-propylene random copolymer; and
a modifier selected from the group consisting of a metallocene-catalyzed polyethylene-based copolymer, a metallocene-catalyzed polyethylene-based terpolymer, and a syndiotactic polypropylene homopolymer.

27. The end-use article of claim 26 being selected from the group consisting of a film, an injection molded article, a compression molded article, a thermoformed article, and a fiber.